

# STUDENT AND SCHOOL CONCENTRATED POVERTY: WHAT ARE THE LONG-TERM CONSEQUENCES FOR ACADEMIC AND CAREER OUTCOMES?

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# COMMISSION ON INNOVATION AND EXCELLENCE IN EDUCATION



# MOTIVATION AND PROCESS

- ▶ At the time, the funding formula for education in Maryland provided supplemental funds for each low-income student
- ▶ Under consideration by the Commission was providing additional supplemental funds for schools with high concentrations of poverty
- ▶ The MLDS Center was asked: *What is the role of school concentrated poverty, over and above student poverty, in long-term academic and workforce outcomes?*
- ▶ Over a 2-year period, we worked with the Commission to refine and operationalize research questions, select appropriate statistical approaches, and situate findings within the larger policy context.

# BACKGROUND

- ▶ Student poverty is consistently linked to poorer physical health, academic achievement, social, emotional, and behavioral functioning (Leventhal & Brooks-Gunn, 2000; McLoyd, 1998).
- ▶ A large body of prior research on concentrated poverty focuses on neighborhood composition
  - ▶ Observational studies indicate a link to detrimental educational outcomes (Burdick-Will et al., 2011; Sampson et al., 2008; Wodtke et al., 2011)
  - ▶ Experimental evidence from the Moving to Opportunity study indicates that moving to a lower poverty neighborhood early in life (before age 13) significantly improved college attendance rates and increased future earnings (Chetty et al., 2015)

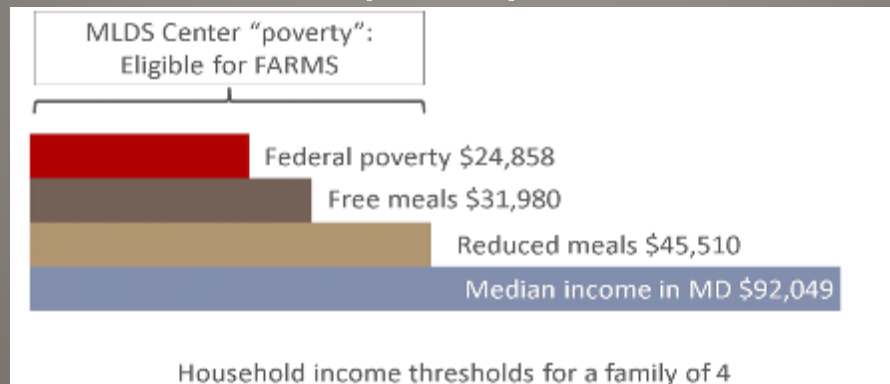


# BACKGROUND CONTINUED

- ▶ In a seminal re-analysis of data from the Coleman Report, the social class composition of a student's school was more than 1 <sup>3</sup>/<sub>4</sub> times more important for educational outcomes than an individual student's social class (Borman & Dowling, 2010).
- ▶ School concentrated poverty is consistently linked to negative educational outcomes (Caldas & Bankston, 1997; Crosnoe, 2009; Konstantopoulos & Borman, 2011; Rumberger & Palardy, 2005).
- ▶ However, measurement issues abound and limited research focuses on post-high school outcomes.

# BACKGROUND: MEASURING POVERTY

- ▶ Education researchers typically use eligibility for the National Student Lunch Program (free/reduced meals; FARMS) measured at a single point in time
  - ▶ Reduced meals = 130% of the poverty level
  - ▶ Free meals = 185% of the poverty level



# BACKGROUND: MEASURING POVERTY CONTINUED

- ▶ Limitations in using FARMS at a single point in time
  - ▶ Fails to capture timing and duration of poverty (Transitory versus persistent poverty; Early versus later poverty)
  - ▶ Community Eligibility Provision (CEP)
  - ▶ Binary variable limits variation
- ▶ Domina and colleagues (2018) showed substantial variation in household income among students in the same FARMS category
- ▶ FARMS at a point in time is typically aggregated to the school level to measure school concentrated poverty (likely imprecise; see Domina et al., 2018)



# BACKGROUND: MEASURING POVERTY CONTINUED

- ▶ Micheltmore & Dynarski (2017) proposed a measure of poverty using the proportion of years a student was eligible for FARMS over time and validated it using data from ECLS-K
- ▶ Students with the highest number of years eligible for FARMS had the lowest scores on standardized tests.

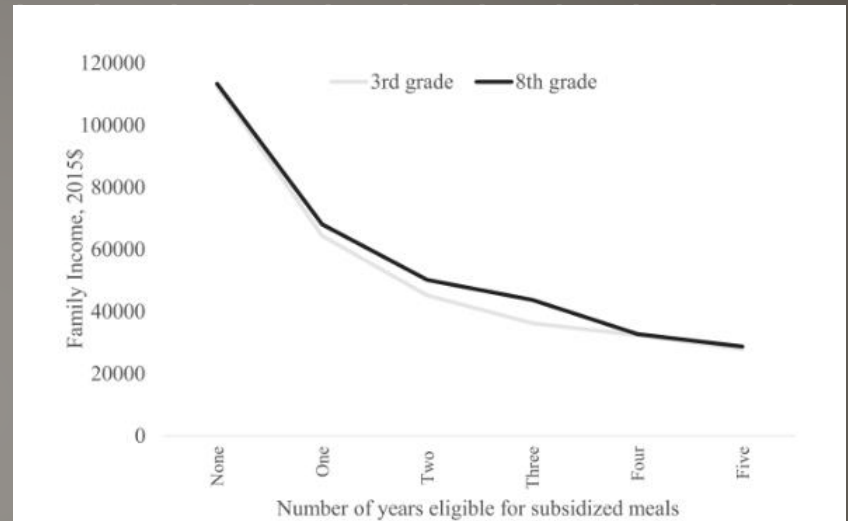


FIGURE 5. *How does income vary over time by number of years eligible for subsidized meals?*

Source. Early Childhood Longitudinal Study–Kindergarten Class of 1998–1999 (ECLS-K).

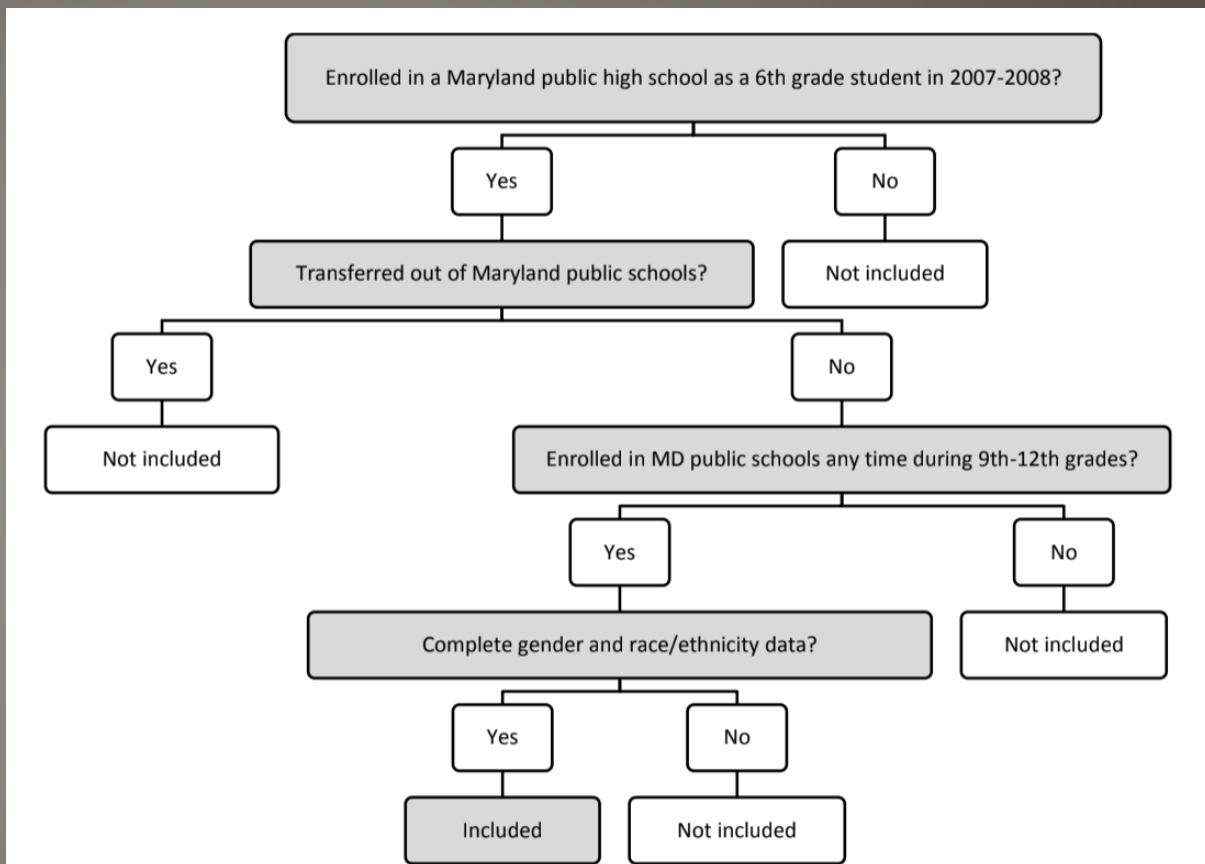
Note. Income measured by assigning the median value within each income category in the ECLS-K, by number of years eligible for subsidized meals. All dollars measured in 2015 dollars using the Consumer Price Index.

# THE CURRENT STUDY

- ▶ We aim to build on Micheltore & Dynarski (2017) to examine the long-run impacts of school concentrated poverty on academic and career outcomes.
  - ▶ We aggregate the proportion of years a student was eligible for FARMS to the school-level to create a measure of school concentrated poverty
  - ▶ We use linked longitudinal administrative data from the Maryland Longitudinal Data System (MLDS) to examine college and early labor market outcomes

# METHOD: MLDS SAMPLE SELECTION

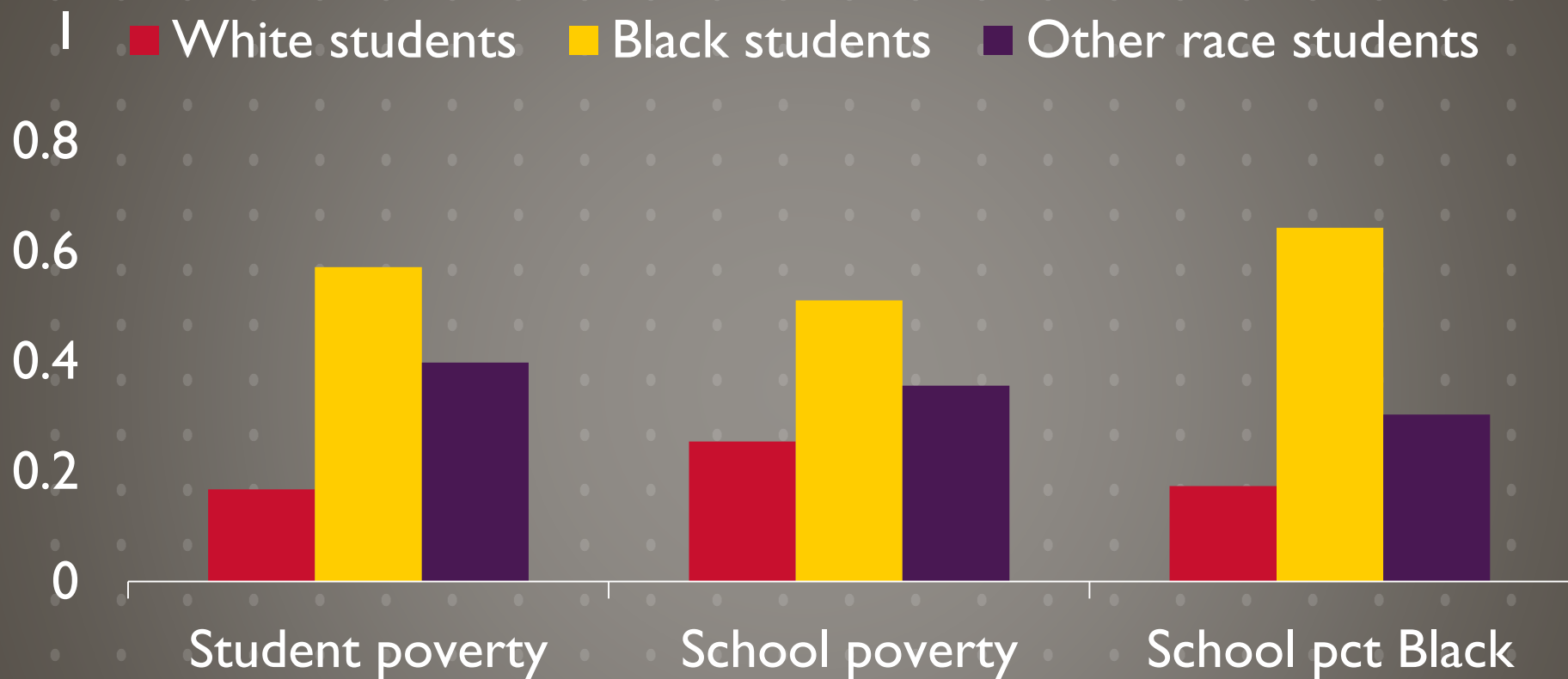
- ▶ All MD public school 6<sup>th</sup> graders in 2007-2008 who did not transfer out of MD public schools ( $N = 52,610$ )



# METHOD: DESCRIPTIVE STATISTICS

Student Characteristic (N = 52,610)	%
Male	50
Asian	5
Black	35
Hispanic	10
Other	4
White	45
Ever eligible for FARMS (6 <sup>th</sup> -12 <sup>th</sup> )	49
Ever English Learner (6 <sup>th</sup> -12 <sup>th</sup> )	3
Ever Special Education (6 <sup>th</sup> – 12 <sup>th</sup> )	14
Ever Homeless (6 <sup>th</sup> – 12 <sup>th</sup> )	4

# POVERTY AND RACE



(N = 52,610)



# METHOD: MEASURING PREDICTORS

- ▶ Poverty – the duration of time eligible for FARMS between 6<sup>th</sup> and 12<sup>th</sup> grades ( $R = 0-1$ ;  $M = 0.36$ ;  $SD = 0.42$ ); multiplied by 10
  - ▶ Aggregated to school level to measure school poverty ( $M = 0.49$ ;  $SD = 0.25$ ); multiplied by 10
- ▶ Race/ethnicity– non-Hispanic White; non-Hispanic Black/African American; Other
  - ▶ Aggregated to school level to measure school racial composition; multiplied by 10
- ▶ Baseline academic performance– Maryland State Assessment (MSA) scores in reading and math; scale scores in 6<sup>th</sup> grade
  - ▶ Aggregated to school level and averaged (high multi-collinearity)

# METHOD: MEASURING OUTCOMES

- ▶ Enrollment in college (1 year post on-time high school grad)
  - ▶ MD and out-of-state
  - ▶ 2-year and 4-year, public and private colleges
- ▶ Employment and wages (1 year post on-time high school grad; separate analyses for college enrollees and non-college)
  - ▶ MD employers subject to MD Unemployment Insurance (UI)
  - ▶ Excludes federal and military, self-employment, out-of-state

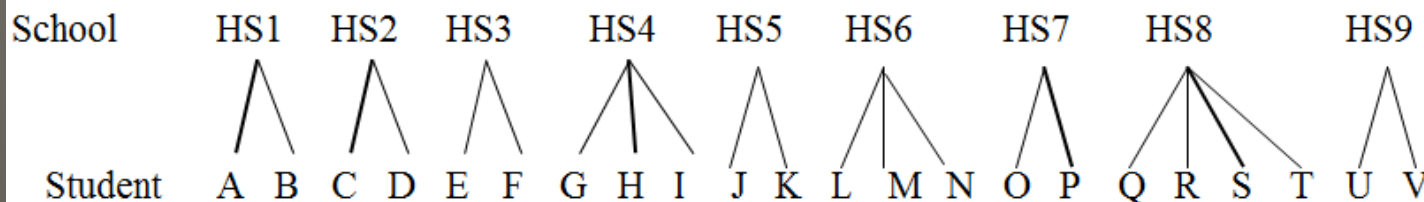
# METHOD: ANALYTIC APPROACH

- Hierarchical Linear Modeling (HLM; Raudenbush & Bryk, 2002) is the traditional statistical approach for correctly adjusting for nesting in educational data

$$\text{Student level: } Y_{ij} = \beta_{0j} + e_{ij}$$

$$\text{School level: } \beta_{0j} = \gamma_{00} + u_{0j}$$

- However, HLM is appropriate when students are nested within only 1 school over time.

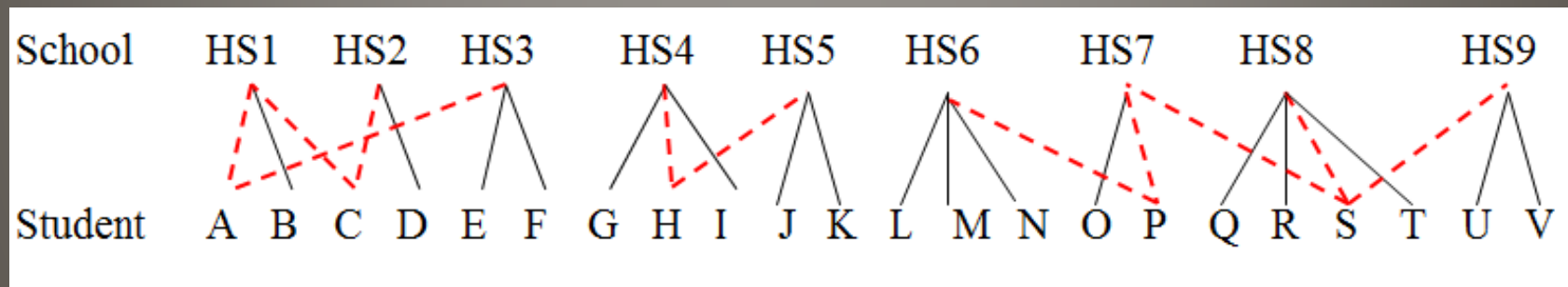


# METHOD: ANALYTIC APPROACH

- ▶ Multiple Membership Multilevel Modeling (MM MLM; Chung & Beretvas, 2012) helps to account for all school attended by each student.

$$\text{Student level: } Y_{i\{j\}} = \beta_{0\{j\}} + e_{i\{j\}}$$

$$\text{School level: } \beta_{0\{j\}} = \gamma_{00} + \sum_{h \in \{j\}} w_{ih} u_{0hj}$$



# METHOD: ANALYTIC APPROACH

## Multiple Membership Multilevel Modeling (MM MLM; Chung & Beretvas, 2012)

Level 1 (Students):

$$Outcome_{i\{j\}} = \beta_{0j} + \beta_{1j}StPov_{i\{j\}} + \beta_{2j}Black_{i\{j\}} + \beta_{3j}Other_{i\{j\}} + \beta_{4j}MSA_{i\{j\}} + e_{i\{j\}}$$

Level 2 (Schools):

$$\beta_{0j} = \gamma_{00} + \gamma_{01}SchPov_{0\{j\}} + \gamma_{02}Black_{0\{j\}} + \gamma_{03}Other_{0\{j\}} + \gamma_{04}MSA_{0\{j\}} + \sum_{h \in \{j\}} w_{ih}u_{0h}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

- Group-mean centering at Level 1
  - Grand-mean centering at Level 2
  - Fixed coefficients; Random intercepts
- (Bell et al., 2018; Enders & Tofighi, 2007)



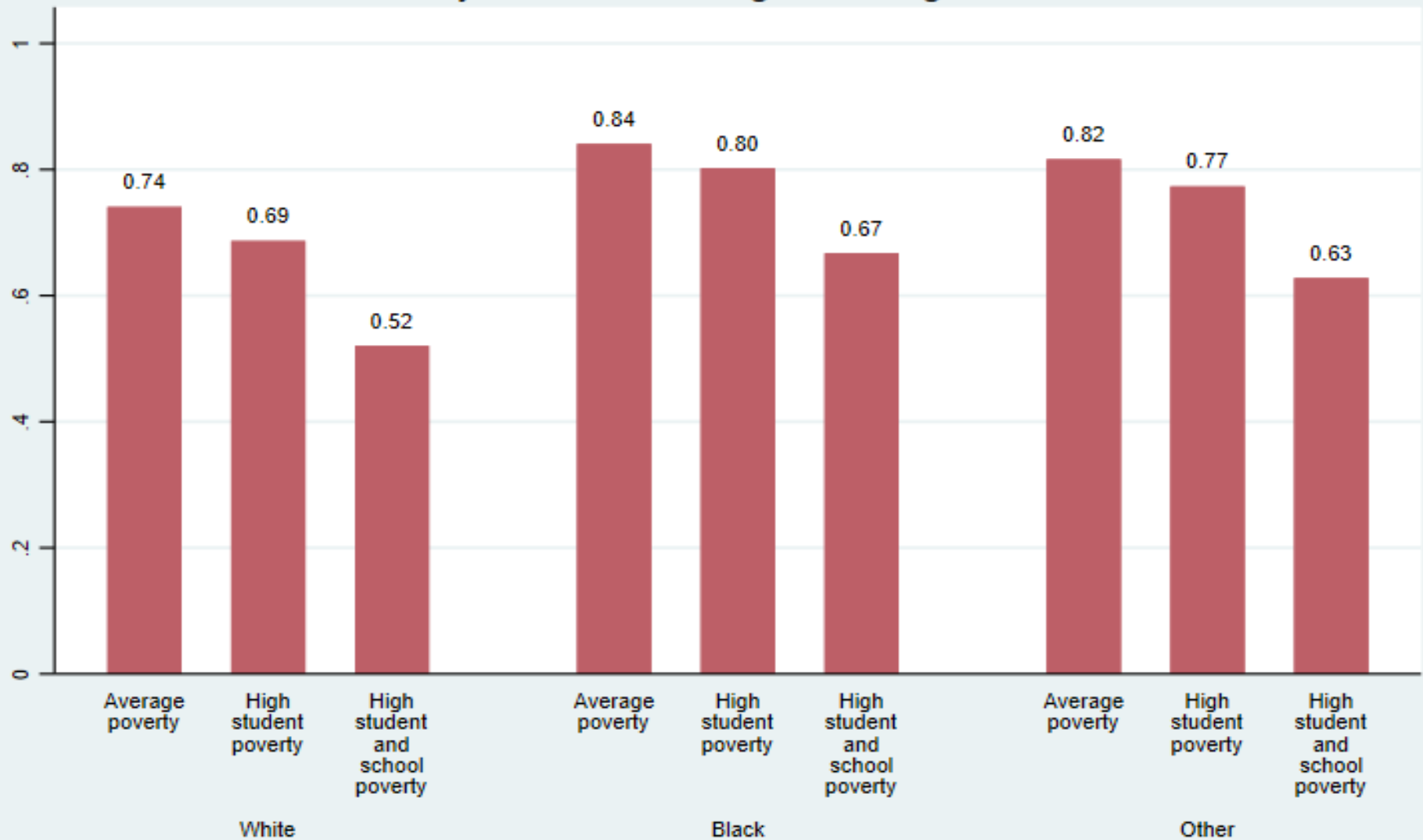
# RESULTS: COLLEGE ENROLLMENT

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Intercept	0.68***	0.06						
Student poverty								
School poverty								
Black								
Other								
Sch pct Black								
Sch pct Other								
6 <sup>th</sup> grade reading								
6 <sup>th</sup> grade math								
Sch 6 <sup>th</sup> grade mean								

# RESULTS: COLLEGE ENROLLMENT

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Intercept	0.68***	0.06	0.94***	0.05	0.99***	0.04	1.05***	0.03
Student poverty			-0.10***	0.00	-0.11***	0.00	-0.18***	0.00
School poverty			-0.32***	0.02	-0.40***	0.02	-0.32***	0.02
Black					0.27***	0.04	0.62***	0.04
Other					0.33***	0.04	0.44***	0.04
Sch pct Black					0.10***	0.02	0.12***	0.02
Sch pct Other					0.23***	0.03	0.22***	0.03
6 <sup>th</sup> grade reading							0.01***	0.00
6 <sup>th</sup> grade math							0.01***	0.00
Sch 6 <sup>th</sup> grade mean							0.02***	0.00

# Predicted probability of enrolling in postsecondary within 1 year of on-time high school graduation

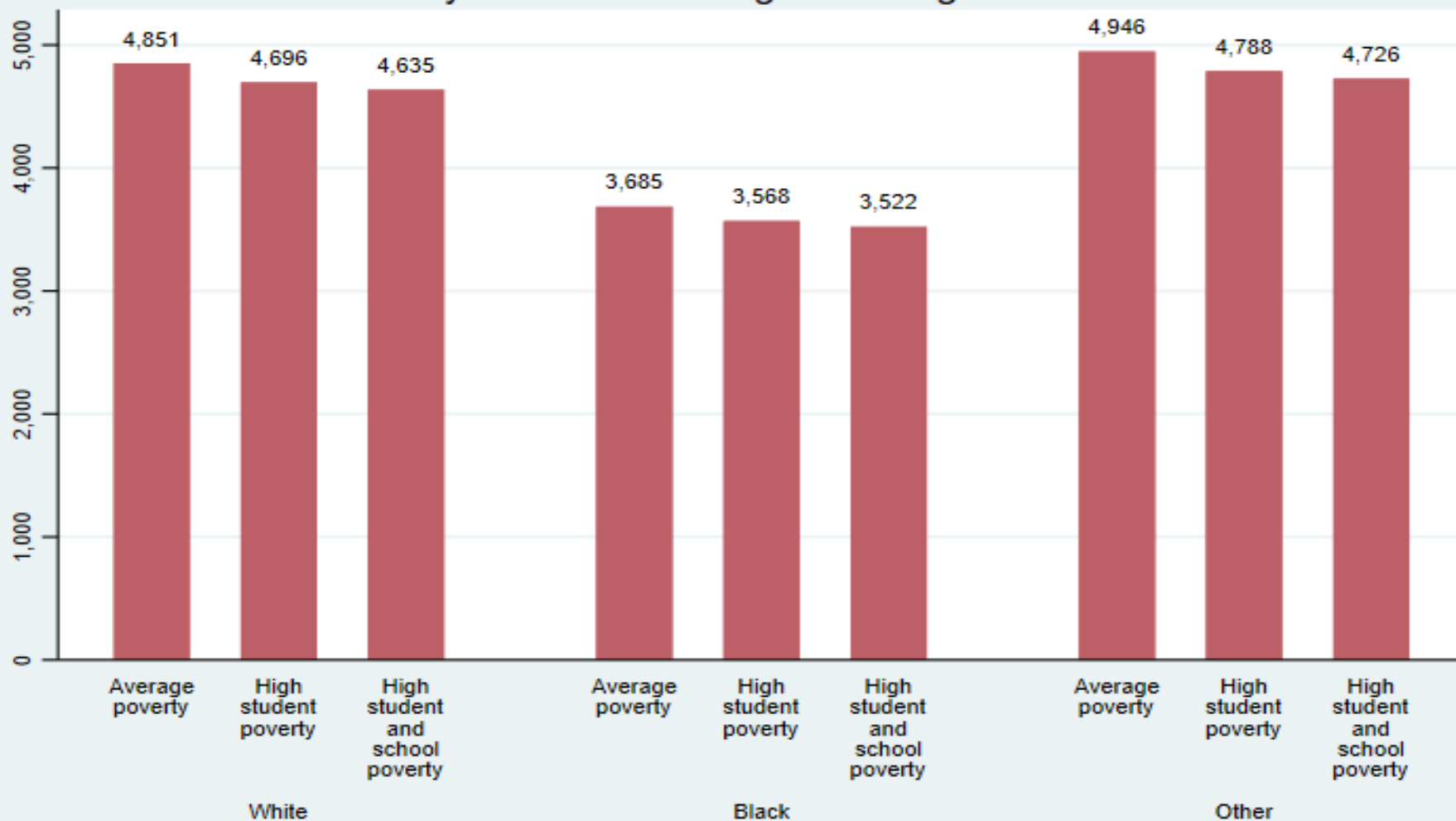


Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time, n=45,580.

# RESULTS: LOG WAGES – NOT IN COLLEGE

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Intercept	8.45***	0.02	8.49***	0.02	8.49***	0.02	8.49***	0.02
Student poverty			-0.01***	0.00	-0.01* 0.00		-0.01* 0.00	
School poverty			-0.04***	0.01	0.01 0.01		-0.01 0.01	
Black					-0.27***	0.04	-0.27***	0.04
Other					0.03 0.05		0.02 0.05	
Sch pct Black					-0.05***	0.01	-0.06***	0.01
Sch pct Other					-0.02 0.01		-0.02 0.01	
6 <sup>th</sup> grade reading							-0.00* 0.00	
6 <sup>th</sup> grade math							0.00* 0.00	
Sch 6 <sup>th</sup> grade mean							-0.00** 0.00	

## Predicted MD wages - not enrolled in postsecondary within 1 year of on-time high school graduation



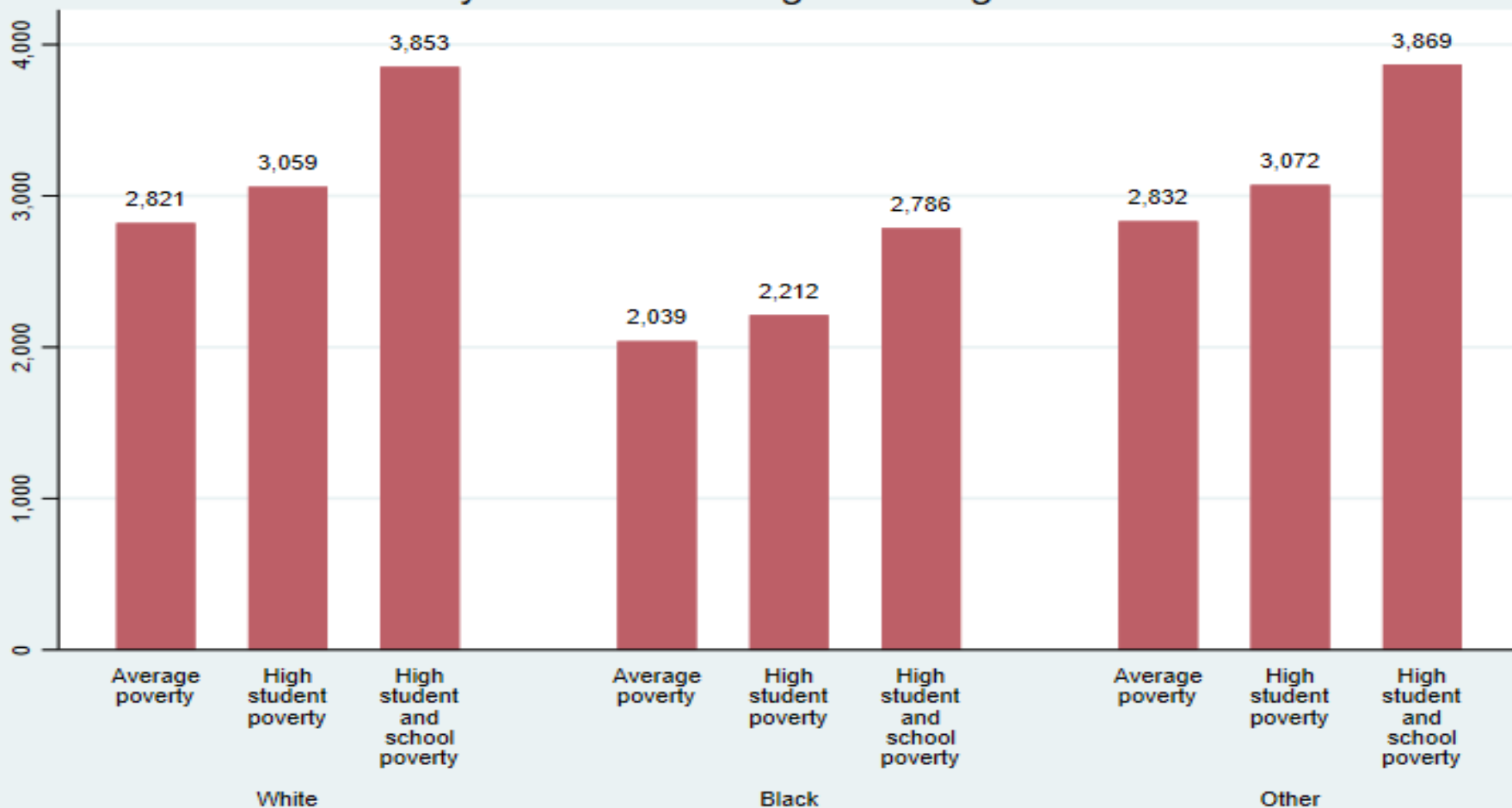
Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time and were not enrolled in postsecondary, n=8,529.



# RESULTS: LOG WAGES – IN MD COLLEGE

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Intercept	7.90***	0.02	7.91***	0.02	7.90***	0.01	7.94***	0.01
Student poverty			0.03***	0.00	0.03***	0.00	0.02***	0.00
School poverty			0.05***	0.01	0.13***	0.01	0.10***	0.01
Black					-0.22***	0.03	-0.32***	0.03
Other					0.04	0.03	0.00	0.03
Sch pct Black					-0.08***	0.01	-0.09***	0.01
Sch pct Other					-0.08***	0.01	-0.08***	0.01
6 <sup>th</sup> grade reading							-0.00***	0.00
6 <sup>th</sup> grade math							-0.00***	0.00
Sch 6 <sup>th</sup> grade mean							-0.01***	0.00

# Predicted MD wages - enrolled in MD postsecondary within 1 year of on-time high school graduation



Note. Model-based predictions based on the cohort of 6th grade students in 2007-08 who graduated from high school on time and were enrolled in postsecondary in MD, n=22,550.

# SUMMARY OF RESULTS

- ▶ Student poverty and school concentrated poverty were associated with worse college and early labor market outcomes
- ▶ Black students had more positive outcomes for college enrollment after controlling for student and school poverty
- ▶ Poverty was related to lower wages for students not enrolled in college
- ▶ Poverty was related to higher wages for students enrolled in college
- ▶ Black students had lower wages after controlling for other variables

# POLICY IMPLICATIONS

- ▶ Additional resources for students in schools with high concentrations of poverty.



- ▶ We need a better measure of student poverty!

SENATE BILL 1030	
F1	9r2562 CF HB 1413
By: The President (By Request – Commission on Innovation and Excellence in Education) and Senators King, Pinsky, Ferguson, and Young	
Introduced and read first time: March 4, 2019	
Assigned to: Education, Health, and Environmental Affairs and Budget and Taxation	
A BILL ENTITLED	
1	AN ACT concerning
2	The Blueprint for Maryland's Future
3	FOR the purpose of stating findings and declarations of the General Assembly; establishing
4	the public policy of the State; establishing principles of The Blueprint for Maryland's
5	Future that are intended to transform Maryland's early childhood, primary, and
6	secondary education system to the levels of high-performing systems around the
7	world; stating certain actions necessary to achieve certain principles; stating certain
8	requirements necessary to establish a world-class education system in Maryland
9	under The Blueprint for Maryland's Future; altering a certain Consumer Price Index
10	used for calculating the target per pupil foundation amount and the student
11	transportation amount for education; requiring the State to provide a certain
12	supplemental grant to certain county boards of education through a certain fiscal
13	year; establishing a Concentration of Poverty School Grant Program; stating the
14	purpose of the Program; requiring the State to distribute certain grants to each
15	county board and the State Department of Education in certain fiscal years;
16	requiring each county board to distribute a certain amount to each eligible school;
17	requiring each eligible school to employ certain staff using certain grant funds;
18	requiring certain eligible schools to use certain funds to provide wraparound services

# LIMITATIONS AND FUTURE RESEARCH

## ▶ Limitations of the current study

- ▶ Unmeasured confounders may bias results
- ▶ Missing data were handled using list wise deletion; attrition may bias results
- ▶ Workforce data exclude large proportion of Maryland employees
- ▶ No data on school expenditures or on household income

## ▶ Future research

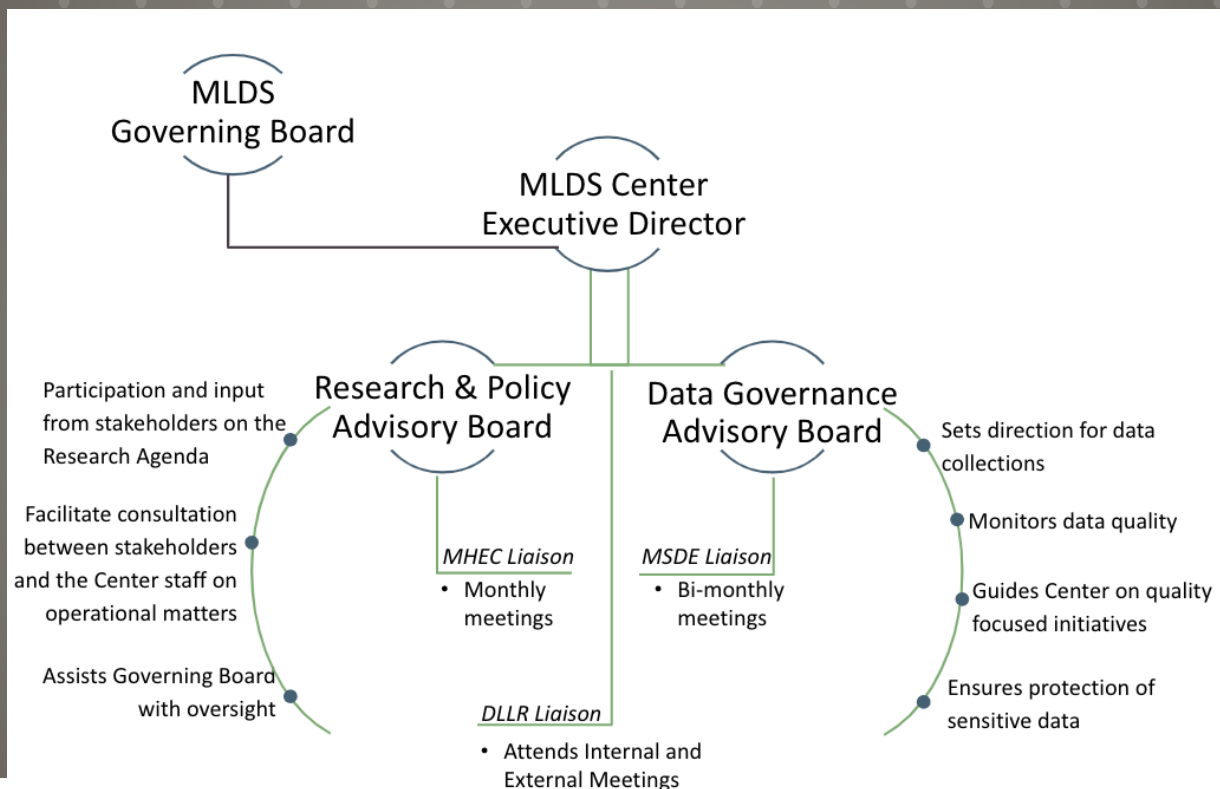
- ▶ Longer-run outcomes
- ▶ Wage trajectory analyses examining the benefit of degree attainment for subgroups of students
- ▶ Analyses examining homelessness as the most severe form of poverty
- ▶ Peer effects research examining the role of peers' academic and behavioral characteristics



# ENGAGING WITH STAKEHOLDERS



# ENGAGING WITH STAKEHOLDERS



# MARYLAND TASK FORCE ON RECONCILIATION AND EQUITY

Chapter 417

(Senate Bill 350)

AN ACT concerning

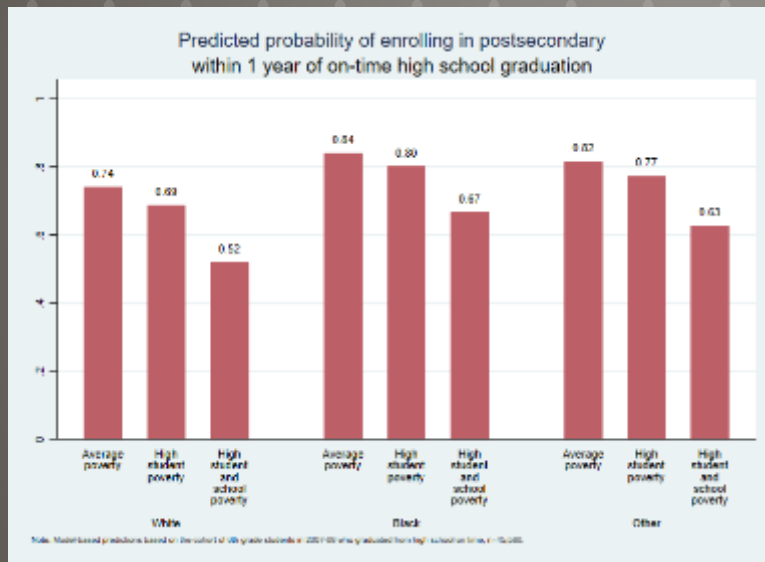
**Morgan State University – Task Force on Reconciliation and Equity**

FOR the purpose of requiring the Institute for Urban Research at Morgan State University to convene a task force to foster reconciliation and inclusionary justice and toward achieving racial equity by taking certain actions; requiring the task force to include certain members; requiring, to the extent practicable, the members of the task force to have expertise in certain matters and reflect a certain diversity; prohibiting a member of the task force from receiving certain compensation; authorizing the reimbursement of certain expenses; providing for the chair and staffing of the task force; authorizing the task force to establish certain subcommittees; requiring the task force to consult with certain units of State government; authorizing the task force to consult with certain units of State government; requiring, on request of the task force, a unit of State government to provide information or staff support in a certain manner or to designate a certain representative to serve as a member or attend a meeting or hearing of the task force; requiring the task force to hold certain hearings and invite certain persons to attend the hearings, to study and make recommendations regarding certain matters; requiring the task force to monitor and evaluate the implementation of certain recommendations using certain criteria; prohibiting a certain person from retaliating against an individual for giving testimony at a hearing held by the task force; requiring, on or before certain dates, the Institute for Urban Research at Morgan State University to submit certain preliminary and full reports to the Governor and the General Assembly; providing for the termination of this Act; and generally relating to a task force on reconciliation and equity convened by the Institute for Urban Research at Morgan State University.

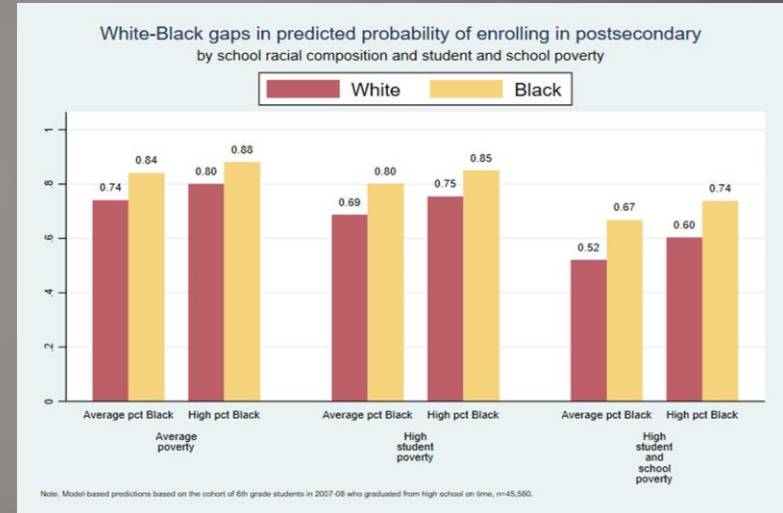


# COMMUNICATING RESULTS

## Commission on Innovation and Excellence in Education



## Task Force on Reconciliation and Equity





# COMMUNICATING RESULTS: CHALLENGES

- ▶ Stakeholder base is large and diverse with varying levels of background in data analytics
- ▶ The modeling approach we used here enabled an “apples to apples” comparison
  - ▶ Some stakeholders still want to see the “apples to oranges” comparisons that show the actual situation
  - ▶ Predicted outcomes can misleadingly look like actual data
- ▶ Informing, but not recommending, policy
- ▶ Timeline mismatch between research and policy

# QUESTIONS AND CONTACT

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